REMARKS

The Office Action of October 15, 2004 was received and carefully reviewed. Reconsideration and withdrawal of the currently pending rejections are requested for the reasons advanced in detail below. Claims 73-116, 123-141 and 143-155 remain pending for consideration in this application.

Referring now to the detailed Office Action, claims 73-116, 123-141 and 143-155 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,563,426 issued to Zhang et al. Applicants respectfully traverse.

In particular, the Office asserts that Applicants prior arguments are not persuasive. Specifically, the Office asserts that Zhang teaches forming a channel region in a portion of a film with no grain boundaries by stating that Zhang teaches in figure 1a, 1b, and 2a-2d forming a channel region (middle portion of 3) in a portion of a film with no grain boundaries (4). Also, the Office states that the single crystal semiconductor regions (6) of Zhang are formed only from those portions of the recrystallized semiconductor that does not include grain boundaries. Furthermore, the Office asserts that the channel-forming regions in figure 1c are the portions of 6 overlapped by gates 7, and thus clearly have no grain boundaries.

In response, Applicants hereby incorporate by reference the arguments provided in the Amendment filed August 18, 2004, the Amendment filed January 26, 2004 and the Amendment filed February 25, 2002, and renew their arguments therein. In particular, Applicants maintain their position that Zhang '426 does not disclose or suggest a channel-forming region having no grain boundary. Accordingly, Applicants respectfully maintain their assertion that the semiconductor regions 6, which is formed in the shaded portion 3 of Zhang '426, include grain boundaries, since crystal grains grow radially from the island nickel region 2 and grain boundaries are generated along with the crystal growth. This technical issue is taught and supported by, e.g., Fig. 2A and column 4, lines 38-57 of U.S. Patent No. 6,011,275 issued to Ohtani et al., and Fig. 5A, 5B, and column 8, lines 27-51, for example, of U.S. Patent No. 5,894,137 issued to Yamazaki et al.

The Office further asserts that Ohtani teaches crystal growth using a "metal element added region 105" in figure 2a and column 4, line 38-57 and Yamazaki teaches crystal growth incorporating designated region 501 "where nickel has been introduced" in figures 5a, 5b and column 8, lines 27-51. Thus, the Office asserts that neither the present invention nor Zhang have a similar "metal element added region" or "a region where nickel has been introduced". Instead, the Office asserts that the present invention and Zhang both incorporate a crystal growth method using a metal deposited on an amorphous silicon layer, and that processes using "the metal element added region" and "a region where nickel has been introduced" are different than the deposited metal used in the present invention and Zhang and thus will not follow the crystal growth patterns of Applicants' prior arguments.

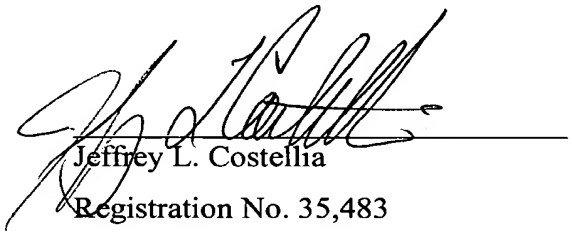
However, Applicants disagree with the Office's contention in this regard, and submit that the crystal grains of Zhang grow radially from the deposited metal, that grain boundaries are generated along with the crystal growth, and that a channel region includes grain boundaries. In particular, Applicants assert that the density of a metal element, the amount of the metal element, and the like may change when an introducing method of the metal element is changed. Furthermore, Applicants assert that a phenomenon occurs wherein a crystal nuclei as a basis of crystal growth is formed in an amorphous silicon film by introducing the metal element and crystals grow from the nuclei. It is believed that this phenomenon occurs irrespective of whether the deposited metal is formed by a sputtering method or whether the metal element added region is formed by a method of coating a solvent containing the metal element.

Ohtani teaches that there are various methods of introducing a metal element including, for example, "a method of coating a solvent containing the metal elements, a method using a CVD method, a method using a sputtering method or a vapor deposition method, a method conducting a plasma processing using an electrode containing the metal, and a method using a gas adsorbing method." (Col. 6, lines 24-29). Thus, Applicants submit that the crystal grains of Zhang grow radially from the deposited metal, grain boundaries are generated along with the crystal growth as disclosed by Ohtani, and that a channel region includes grain boundaries.

In view of the arguments set forth above, the invention as recited in claims 73-116, 123-141 and 143-155 would not have been obvious to a person of ordinary skill in the art at the time of the invention based on the teachings of Zhang et al. Accordingly, Applicants respectfully request reconsideration and withdrawal of the pending §103(a) rejections.

While the present application is now believed to be in condition for allowance, should the Examiner find some issue to remain unresolved, or should any new issues arise, which could be eliminated through discussions with Applicants' representative, then the Examiner is invited to contact the undersigned by telephone in order that the further prosecution of this application can thereby by expedited.

Respectfully submitted,



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